

Mukri_2019_J._Phys.___Conf._S er._1155_012001.pdf

by

Submission date: 05-Mar-2020 02:03PM (UTC+0700)

Submission ID: 1269707925

File name: Mukri_2019_J._Phys.___Conf._Ser._1155_012001.pdf (357.05K)

Word count: 3095

Character count: 16528

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To cite this article: Moh. Mukri *et al* 2019 *J. Phys.: Conf. Ser.* **1155** 012001

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Quran-integrated science in the era of industrial revolution 4.0

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Abstract: Lately, the world is facing the industrial revolution era 4.0. Science and technology as one of the benchmarks of the industrial revolution era 4.0 contain some positive and negative effects. The negative impacts can be minimized by integrating science and the Quran. The Quran can be used all the time without limits. There has never been a change in its verses, but modern science has succeeded in revealing the secrets of Allah and His teachings contained in the Quran. Without science, the Quran is merely texts that cannot explain natural phenomena in detail. Through the existence of science, Quran is more alive and meaningful because science has been able to prove the truth of the Quran. Likewise, religion has provided a number of valuable information for scientific purposes which are subsequently confirmed by science to be followed-up by scientific discoveries.

1. Introduction

Nowadays, the world is facing the era of industrial revolution 4.0 [1–3]. This era is characterized by the emergence of autopilot aircraft, smart robots, super computers, new technology and nano technology [4–7]. The industrial revolution 4.0 is a change of work that focuses on the pattern of digital economy, artificial intelligence, big data, robotic and others. These changes are known as the disruptive innovation phenomenon [8]. In this era, the speed and use of internet technology can lead anyone to become a winner [9]. But on the other hand it leaves a series of problems, namely the replacement of the role of humans by smart machines and the internet. To deal with the problem of industrial revolution 4.0, it is necessary to prepare highly competitive human resources that prioritize the quality not quantity [10]. The highly instrumental Institution in preparing human resources is Education [11].

The science and technology education provides progress in the development of the industrial revolution 4.0. Science and technology are two things that cannot be separated [12]. Science studies nature and its aspects that are applied and used in everyday life through technology [13, 14]. Technology can be accessed anywhere and by anyone without boundaries [15, 16]. Technology can have a positive and negative impact [17–19]. To minimize the negative impacts of the technology, a vast knowledge and understanding of religion is certainly needed.

One of the religions in Indonesia is Islam [20–24]. Islam never forbids its believers be advanced and modern. Islam strongly supports its people to conduct research and experiments in any matter including science and technology [14, 25]. In the perspective of Islam, science and technology are regarded as parts of the verses of Allah (Quran), which need to be researched [26]. Several studies have examined science and technology in the industrial revolution era 4.0 [8, 14, 25]. This study examines science integrated with the Quran in the industrial revolution era 4.0.



2. Methods

This study uses literature research or is known as library research. The method used is qualitative with content analysis. The research theory through data sources such as the Quran, books, and articles related to Quran-based science in the era of industrial revolution 4.0 was described qualitatively. From the literature study, the data is compared between scientific information from the perspective of the Qur'an and the industrial revolution 4.0. Qualitative data analysis consists of four steps that occur simultaneously, namely categorization, data reduction, data presentation, and data conclusion/verification:



Table 1 The Stages of Research

Science is created by God while humans discover and develop it [26]. Science holds a very important position in Islamic teachings [27]. This is indicated by the many verses of the Quran that view knowledgeable people in high regard [28]. The word science in the Quran is used more than 800 times [29-30]. Verse of the Quran, besides positioning knowledge and knowledgeable people in a special position, also encourages them to always pursue more knowledge by reading and reading. This is in line with Surah Al-Alaq verses 1-5: "Recite in the name of your Lord who created. Created man from a clinging substance. Recite, and your Lord is the most Generous. Who taught by the pen. Taught man that which he knew not." [28]. Surah Al-Alaq motivates Muslims to never stop their studies and continue reading. A lot of knowledge needs to be learned in the field of technology and science.

Science is one of the studies of the universe and its contents. The universe is basically an order that works with the law and the potential that God bestows on His people [31]. Humans are assigned by God to try to find, understand, and master the laws of nature so it can be exploited for good purposes [32]. Thus, the universe created by God is not ready to be taken benefit of without having the knowledge to process and build by humans. The study of natural knowledge or science throughout the history of human civilization has always occupied a special position which is in the center of attention in each of its epochs. The achievement of science becomes evidence as well as a witness to the history of human civilization [33]. Interestingly, the more someone studies science, the more his faith increases [34]. Science itself is a gift from God that shows His greatness and omnipotence [35]. In Cecep Sumarna's view, the progress nowadays is the result of the advancement of science and technology as if it have reached its peak. In ancient times what was considered impossible now became an amazing reality [36].

The changes of era are bound to happen but Islam will remain consistent and appropriate for every era. The Quran is a *hudan* that can be used at any time without boundaries. There has never been a change in the verses of Quran but modern science has succeeded in revealing the secrets of Allah for its teachings contained in the Qur'an [37]. Without science, the Quran is merely texts that cannot explain natural phenomena in detail and contain universal teachings that still leave a question mark. The existence of science could make Quran to be more alive and meaningful because science is able to prove the truth of the Quran. This means that science has contributed greatly to the teachings of religion that have not been revealed so far. Likewise, religion has provided a basis for a number of valuable information for scientific purposes which are subsequently confirmed by science to be followed-up through scientific evidences. As a holy book that contains the teachings of God, the Quran will always give motivation and encouragement for humans to read, study, and reflect the natural phenomena as signs of the power and omnipotence of Allah

[38]. The success of science in revealing the secrecy of God is supported by increasingly sophisticated technology.

Science and technology is one of the benchmarks of the modern era, the modern era is now called the era of industrial revolution. The industrial revolution was introduced by Friedrich Engels and Louis Auguste Blanqui in the mid-19th century [39]. The industrial revolution runs from time to time. At this time has entered the fourth phase (4.0). Science and technology has become a symbol of progress and success in the era of industrial revolution 4.0. The changes of phases give an articulatory differences in its terms of use. The first phase (1.0) is concerned with the discovery of machines that emphasize the mechanization of production. The second phase (2.0) has moved on to an integrated mass production stage with quality control and standardization. The third phase (3.0) is the stage of mass uniformity which relies on computerized integration. The fourth phase (4.0) has presented digitalization and automation of the integration of the internet with manufacturing [38].

The industrial revolution 4.0 is characterized by 5 technological keys, namely: (1) Artificial Intelligence, (2) Internet of Things, (3) Advanced Robotics, (4) Wearable / Augmented Reality / Virtual Reality and (5) 3D Printing. The industrial revolution 4.0 not only increases the value of a product, but also values from: individuals (new skills, becoming technology-based operators), society (accelerating sustainable production), industry (productivity & efficiency, growth and new added value, digitalization), companies (smart innovation and engineering, digital orchestration of supply chains, smart and personalized products, new business models), and factories (smart processes, operator-machine productivity, smart structure, location and scale) [40].

The result of the industrial revolution 4.0 is the emergence of the innovation disruptive phenomenon. The impact of this phenomenon has spread in all areas of life. Starting from education, industry, economy, politics, etc. [41-43]. This phenomenon has also succeeded in shifting the lifestyle and mindset of the world community [8]. Disruptive innovation can be interpreted as a phenomenon of disruption of the incumbent industry players by new industry players due to the ease of information and technology.

The phenomenon of the industrial revolution 4.0 includes autopilot and smart robots. The aircraft is now being developed with an automatic pilot or autopilot. The autopilot simplifies the work of a pilot who used to be very difficult and tiring to be much simpler [44-46]. Smart robots will make human work easier for example servant robots. Servant robots can operate semi-automatically or fully automatically to perform services that are beneficial to human welfare. Servant robots help humans in their daily lives and are placed in various fields [47-50].

3. Conclusions and Suggestions

Changes in the era are bound to happen but Islam will remain consistent and appropriate for every era. The Quran is a *hudan* that can be used by anyone without boundaries. There has never been a change in the verses in the Qur'an, but modern science has succeeded in revealing the secrets of Allah for its teachings contained in the Quran. Without science, the Qur'an is merely texts that cannot explain natural phenomena in detail and contain universal teachings that still leave a question mark. The existence science could make Quran to be more alive and meaningful because science has been able to prove the truth of the Quran. The development of science needs technology. Science and technology became a symbol of progress in the era of industrial revolution 4.0. Progress that occurs has positive and negative impacts. To deal with the negative impacts of science in the era of industrial revolution, there needs to be an understanding of the Quran. As Muslims, we need to conduct research to discover the greatness of God and need to choose the right technology to develop.

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